

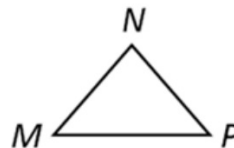
Warm-up: Tuesday, Dec. 7, 2010

Benchmarking tomorrow in library

Quiz Friday on 4.1 and 4.2

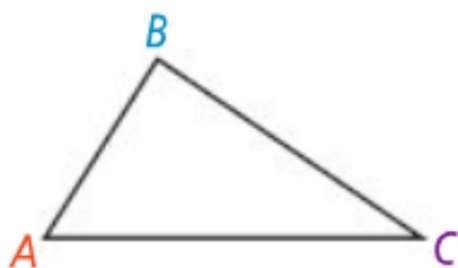
Warm Up

1. Find the measure of exterior $\angle DBA$ of $\triangle BCD$, if $m\angle DBC = 30^\circ$, $m\angle C = 70^\circ$, and $m\angle D = 80^\circ$.
2. What is the complement of an angle with measure 17° ?
3. How many lines can be drawn through N parallel to \overline{MP} ? Why?



4.2 Angle Relationships in Triangles

Triangle Sum Theorem: the sum of the measures of a triangle is 180 degrees.



$$m\angle A + m\angle B + m\angle C = 180$$



Auxilliary Line:

a line that is added to a figure to aid in a proof

In notes:

Triangle Sum Theorem

Given: $\triangle ABC$

Prove: $m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$



Statements

Reasons

① $\triangle ABC$

① Given

② Draw line l
 $l \parallel \overline{AC}$ through B

② Auxilliary Line

③ $\angle 3 \cong \angle 5$

③ Alt. Int. \angle Thm

④ $\angle 4 \cong \angle 1$

④ Alt. Int. \angle Thm

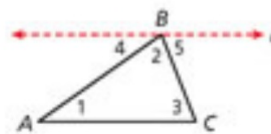
Continued

Triangle Sum Theorem

Given: $\triangle ABC$

Prove: $m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$

Proof:



Statements

- 5) $m\angle 4 + m\angle 2 + m\angle 5 = 180$
- 6) $m\angle 5 = m\angle 3$, $m\angle 4 = m\angle 1$
- 7) $m\angle 1 + m\angle 2 + m\angle 3 = 180$

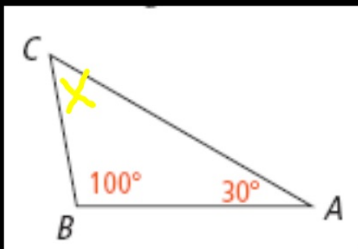
Reasons

- 5) Def. of a straight angle
- 6) Def. of congruent angles
- 7) Substitution

Example 1:

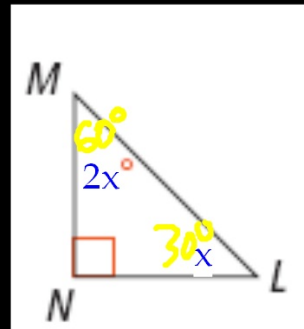
Find the measures of the missing angles.

(a)



$$\begin{aligned} X + 100^\circ + 30^\circ &= 180^\circ \\ X + 130^\circ &= 180^\circ \\ X &= 180^\circ - 130^\circ \\ X &= 50^\circ \end{aligned}$$

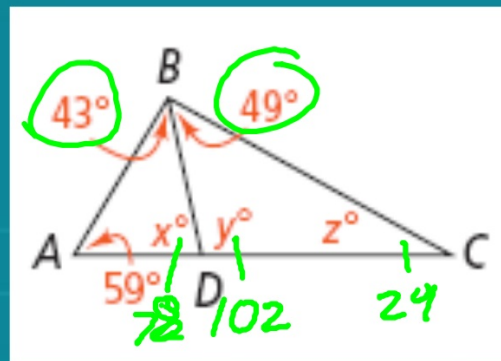
(b)



$$\begin{aligned} 2x + X &= 90 \\ \frac{2x}{2} &= \frac{90}{2} \quad X = 30 \end{aligned}$$



Example 2: Find the measures of x , y , and z



$$\begin{array}{r} 43 \\ + 59 \\ \hline 102 \end{array}$$

Can you find 2 different ways to solve it?

$$\begin{array}{r} 180 \\ - 102 \\ \hline 78 \end{array} \quad \begin{array}{r} 180 \\ - 78 \\ \hline 102 \end{array} \quad \begin{array}{r} 102 \\ + 49 \\ \hline 151 \end{array} \quad \begin{array}{r} 180 \\ - 151 \\ \hline 29 \end{array}$$



Example 3:

The measure of one of the acute angles in a right triangle is given. What is the measure of the other acute angle?



a. 63.7°

$$\begin{array}{r} 90.0 \\ 153.7 \\ \hline 180.0 \\ 153.7 \\ \hline \textcircled{26.3} \end{array} \quad 90 - 63.7$$

b. x°

$$\begin{array}{r} x + y = 90 \\ -x \\ \hline y = \textcircled{90 - x} \end{array}$$

c. $48\frac{2}{5}^\circ$

$$\begin{array}{r} 90 - 48\frac{2}{5} \\ \hline 41\frac{3}{5} \\ 41.6 \end{array}$$

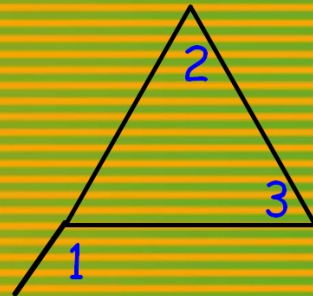
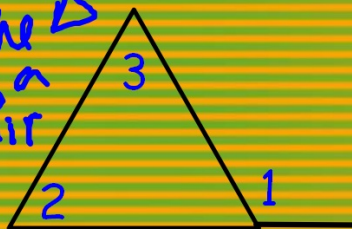
Exterior Angle Theorem:

The measure of an exterior angle of a triangle is equal to the sum of the measures of the remote interior angles

$$m\angle 1 = m\angle 2 + m\angle 3$$



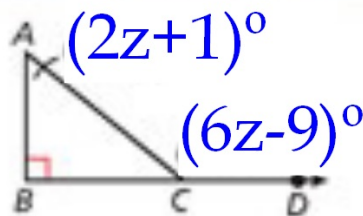
ext. \angle
outside the \triangle
and forms a
linear pair



remote interior \angle s:
2 angles inside the \triangle but not adjacent
to the exterior angle

Example 4:

Find $m\angle ACD$.



$$\begin{aligned} 2z + 1 + 90 &= 6z - 9 & m\angle ACD &= 6z - 9 \\ 91 &= 4z - 9 & m\angle ACD &= (25) - 9 \\ 100 &= 4z & m\angle ACD &= 14^\circ \\ 25 &= z \end{aligned}$$



HW=

4.2 Practice (skip 9, 10, 12 for now)

4.2 Problem Solving

